REMARKS/ARGUMENTS

Claims 1-90 are pending in the application. Claims 1-90 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Applicant respectfully traverses this rejection for the following reasons and those set forth in Applicant's response filed March 30, 2005. Applicant further asserts that the rejection has been rendered moot by the present amendments to the independent claims.

The Federal Circuit has ruled that a process is patentable under Section 101 if it produces a 'useful, concrete, and tangible result'. State Street Bank & Trust Co. v. Signature Financial Group, Inc. 149 F. 3d 1368, 1373-74, 47 USPQ2d 1596, 1601-02 (Fed. Cir. 1998).

To satisfy section 101 requirements, the claim must be for a practical application of the § 101 judicial exception, wherein the claimed invention otherwise produces a useful, concrete and tangible result. For an invention to be "useful" it must satisfy the utility requirement of section 101. MPEP § 2107(B)(1) states, "If the applicant has asserted that the claimed invention is useful for any particular practical purpose (i.e., it has a "specific and substantial utility") and the assertion would be considered credible by a person of ordinary skill in the art, do not impose a rejection based on lack of utility."

Independent claims 1, 27, and 51 each recite a statutory process that produces a useful, concrete and tangible result. Claim 1 recites, *inter alia*, "outputting from said at least one output processing layer a final digital representation of the results of said combination and minimization steps to an external device or user." Claim 27 recites, *inter alia*, "at least one input processing layer means which is capable of rendering a stable transformable digital representation of input signals" and "means for using re-entrant feedback from the output channel means to perform

minimalization for general computation such that said stable transformable digital representations of input signals are distributed to said plurality of computational nodes...." Claim 51 recites, *inter alia*, "using at least one output to output processed data that can be used by a human or as an input to a machine." Thus, the processes claimed in claims 1, 27 and 51 do more than manipulate basic mathematical constructs, and are patentable under section 101, even under the In Re Warmerdam and AT&T Corp. v. Excel Communications rulings cited by the Examiner.

Independent claim 70 is directed to a data processing apparatus that falls squarely within the "machine" statutory class of invention set forth in section 101. Nonetheless, claim 70 has been amended to clarify the tangible and concrete nature of the claimed invention, and is patentable under section 101 for the same reasons as set forth above with regard to the method claims.

Claims 1-90 also stand rejected under 35 U.S.C. § 112, first paragraph in connection with the section 101 rejection. In particular, the Examiner alleges that Applicant has not disclosed a practical application for the claimed invention. Applicant traverses, and respectfully directs the Examiner's attention to paragraph [0057] of the present specification, which discloses that the claimed invention is useful for "rapid, unsupervised processing of complex data sets, such as imagery, databases, textual files, or continuous human speech." Paragraph [0057] is an assertion that the claimed invention is useful for specific and substantial purposes, and this assertion would be considered credible by a person of ordinary skill in the art. Therefore, the utility requirement of section 101, and its counterpart in section 112, first paragraph, have been met and the rejection should be withdrawn. See MPEP § 2107(B)(1).

Claims 1-5 and 27-31 stand rejected under 35 U.S.C. 102(b) over Lo. Applicant respectfully traverses.

The Examiner asserts that FIG. 6 of Lo anticipates the layered architecture recited in independent claims 1 and 27. Applicant disagrees. FIG. 6 is "a typical multilayer perceptron with output feedbacks."[1] Neural networks all have layers, and most have feedback connections. They are distinguished by the computations performed within the architecture. In Lo, the computations are weighted averages compared to a threshold, and learning is accomplished by means of "the group consisting of the conjugate gradient methods, the quasi-Newton methods, and the gradient descent methods."

The present invention as recited in claims 1 and 27, however, uses known connection methods to combine representations and transform them by a minimalization step, which is why it is referred to as "implicit". FIG. 6 of Lo does not teach or suggest such combination and transformation. Rather, it merely discloses an example of the various connections, layers and nodes that can be found in virtually any neural network.

As to "minimalization," the invention of independent claims 1 and 27 requires minimalization to be applied as the computation step given the data presented at a given node and the success criterion stated for that node. That places the computational requirement on specifying or evolving the connections and stating the success criteria so that they work at specific nodes, not general criteria for the whole network. Thus, where Lo uses minimization of a derivative in his claim 39, that is not the learning criterion, it is the measurement used by his invention to adjust the weights by a different weighting method (gradient descent, etc.). In the present invention, as recited in claims 1 and 27, the lowest valued combinations that meet the criteria are selected, and the others are not. That means that the connections and criteria are critical, not the fairly simple minimalization step.

[1] Since perceptrons are feedforward, FIG. 6 is an oxymoron.

The Examiner asserts that Lo anticipates claimed implicit computation because it does not involve mathematical models, formulas, equations, such as the Markov process. It applies to all signal processes, and thus, according to Examiner, to all supervised learning processes as well. Applicant disagrees. Lo discloses a method for estimating a signal process, which he defines as follows:

> A process is an ordered sequence of vector-valued variables
> with the same dimension. . . .
> The collection of all the processes whose values at each
> time are what we want to estimate is called a signal process

See Lo, col. 7, lines 22-34. The invention disclosed by Lo attempts to provide those values using a recurrent neural network. The present invention does not require an ordered sequence of vector-valued variables with identical dimensions, although such variables would be possible inputs.

The Examiner comments at page 18 of the office action that the term "local" has not been defined and is therefore given a broad interpretation. However, to a person of ordinary skill in the art, the term "local" in the context of the claimed invention means that each computational node applies its computation based solely on the inputs it receives within a specified time window, using specified success criteria. That is, a node is only "aware" of what it "sees" at a given time, and does not "know" anything else about what is happening in the network. Given this interpretation, Lo clearly fails to teach or suggest the claimed local update steps.

In view of all of the above, independent claims 1 and 27, and their dependent claims 2-5 and 28-31, are not anticipated by Lo and the rejection over Lo should be withdrawn.

C O N C L U S I O N

Having responded to all objections and rejections set forth in the outstanding Office Action, it is submitted that claims 1-90 are in condition for allowance and Notice to that effect is respectfully solicited. In the event that the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, he is courteously requested to contact applicant's undersigned representative.

Respectfully submitted,

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